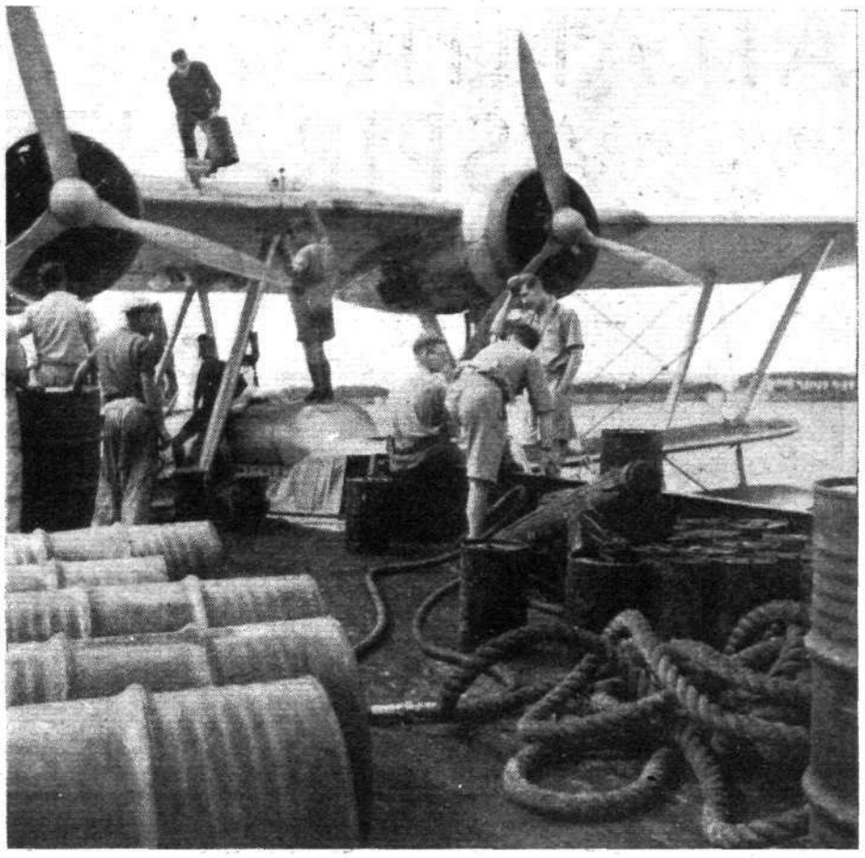

if sufficiently expanded, could make a hostile invasion impossible, and, therefore, should receive all the help which the Government can give, while money spent on a Navy is waste. This policy is called by the Government spokesmen "isolationist," on the ground that Australia would never be able to help the Imperial Army or Navy, and would hardly look to them for help in defeating an invasion.

Flight is naturally neutral so far as politics are concerned, but in this case it appears that the plan of the Opposition is on the sounder basis. It is manifest that no Navy which Australia could ever afford would be much protection by itself, and it could only be useful when working in conjunction with the Imperial fleet based on Singapore. An Air Force, on the other hand, might well be able to make invasion impossible, though it could not prevent a blockade of the Australian coast. In any case, only the Imperial Navy could do that. Any invaders must obviously come from over the sea, and must have a long line of communications. Transports are particularly vulnerable ships, and few would deny that a landing is an impossibility in the face of a vigorous Air Force. The mobility of an Air Force enables it to defend a much greater length of coast than any ships or troops could do.

Nor can we see that Australian reliance on air defence can justly be called isolationist. In war Britain must go heart and soul to the help of any threatened Dominion, and we want no Achilles' heels in the Empire. If the Royal Australian Air Force can ensure the safety of the Australian coast line, that lightens by so much the responsibility which Britain has to shoulder. Of course, any contribution which the Commonwealth can make to the naval strength of the Empire will always be welcome. It was H.M.A.S. *Sydney* which scotched the *Emden*. Likewise, the deeds of Australian soldiers are not forgotten. But geography dictates that in the defence of Australia the air should take pride of place.

The Revivalists

HISTORY certainly does repeat itself. Some of the early aeroplanes had wheels in front and wheels behind; Mr. Cody, of unforgettable memory, even put wheels on his wing tips, and one German pioneer beat them all by putting wheels above his wings so that the machine could land just as well upside down!

That was in the days when we were mainly concerned with getting aeroplanes into the air and did not worry overmuch about drag. But as soon as aero engines got to the point of running for half an hour or so without packing up, we began to realise that the aeroplane was everlastingly climbing up a hill of one in five or so, and that if we could, by suppressing drag-producing members, increase the ratio of lift-drag to 10: 1, the machine would be climbing a hill only half as steep.

With that realisation came the "axe." Every strut and wire that was not absolutely essential was removed. That this operation was not altogether superfluous will be realised when we recall that one of the early Dunne tailless machines was said to have twenty-seven struts in its undercarriage (we cannot guarantee the figure, as we never had the the time to count them); and who of the old-timers does not remember the so-called canary test?

Gradually the skids disappeared, the wires were reduced in number, and the orthodox type of aeroplane became the tractor biplane, with one or two bays according to span, and with vee undercarriage struts and cross axle.

Retractable Tricycles

THE next step was the retractable undercarriage. Speeds had gone up to the point where to tolerate an undercarriage drag of perhaps one-sixth of the total was not to be thought of. The result we see all round us at the present time: the low-wing cantilever monoplane with two or four engines and the wheels retracting into the engine nacelles. But the two-wheel undercarriage brought with it certain disadvantages; these had almost come to be accepted as inevitable until a few bright lads remembered that there was something to be said for the undercarriages of the early aeroplanes. By burying them the extra drag does not matter, and so we are now threatened with a spate of retractable tricycles.

How great importance is attached to this subject is illustrated by the fact that one British firm has stated that it considers the abandonment of the low-wing type justified in order to provide a neater retracting three-wheeled undercarriage in a high-wing layout.

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